

1                    CLAIMS:

2                    1. A semiconductor processing method, comprising:  
3                    forming a layer of material over a semiconductive wafer substrate;  
4                    exposing some portions of the layer to energy while leaving other  
5                    portions unexposed, the exposing altering physical properties of the  
6                    exposed portions of material relative to the unexposed portions of  
7                    material;  
8                    after the exposing, subjecting the exposed and unexposed portions  
9                    of the layer to common conditions, the common conditions being  
10                   effective to remove the material and comprising a rate of removal that  
11                   is influenced by the altered physical properties of the layer, the common  
12                   conditions removing either the exposed or unexposed portions faster  
13                   than the other of the exposed and unexposed portions; and  
14                   after the selective removal of the exposed or unexposed portions,  
15                   and while the other of the exposed and unexposed portions remains  
16                   over the substrate, cutting the wafer into separated die.

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18                   2. The method of claim 1 wherein material comprises silicon.

20                   3. The method of claim 1 wherein the material comprises  
22                   carbon, silicon and oxygen.

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4. The method of claim 1 wherein the material comprises  
5 silicon bound to a hydrocarbon group and bound to oxygen.

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5. The method of claim 1 wherein the material comprises  
 $(\text{CH}_3)_y\text{Si}(\text{OH})_{4-y}$ , with y being greater than 0 and less than 4.

6. The method of claim 1 wherein the material comprises  
 $\text{Si}(\text{OH})_4$ .

7. The method of claim 1 wherein the energy is in the form  
of ultraviolet light.

8. The method of claim 1 wherein the energy is in the form  
of an electron beam.

9. The method of claim 1 wherein the energy is in the form  
of a plasma.

10. A semiconductor processing method, comprising:  
1 forming a layer of a silicon-comprising material over a substrate;  
2 exposing some portions of the layer to energy while leaving other  
3 portions unexposed, the exposing altering physical properties of the  
4 exposed portions relative to the unexposed portions; and  
5 after the exposing, subjecting the exposed and unexposed portions  
6 of the layer to common conditions, the common conditions being  
7 effective to remove the silicon-comprising material and comprising a rate  
8 of removal that is influenced by the altered physical properties of the  
9 layer, the common conditions removing either the exposed or unexposed  
10 portions faster than the other of the exposed and unexposed portions.

11. ~~13. 11.~~ The method of claim ~~10~~ <sup>12</sup> wherein the silicon-comprising  
12 material comprises carbon, silicon and oxygen.

13. ~~14. 12.~~ The method of claim ~~10~~ <sup>12</sup> wherein the silicon-comprising  
14 material comprises silicon bound to a hydrocarbon group and bound to  
15 oxygen.

15. 13. The method of claim 10 wherein the silicon-comprising  
2 material comprises silicon bound to a hydrocarbon group and bound to  
3 oxygen, and wherein the hydrocarbon group does not comprise a carbon-  
4 containing ring.

16. 14. The method of claim 10 wherein the silicon-comprising  
2 material comprises  $(CH_3)_ySi(OH)_{4-y}$ , with y being greater than 0 and less  
3 than 4.

17. 15. The method of claim 10 wherein the silicon-comprising  
2 material comprises  $Si(OH)_4$ .

18. 16. The method of claim 10 wherein the energy is in the form  
2 of ultraviolet light.

19. 17. The method of claim 10 wherein the energy is in the form  
2 of an electron beam.

20. 18. The method of claim 10 wherein the energy is in the form  
2 of a plasma.

See  
Cont'd

1 21. 19. The method of claim 10 wherein the silicon-comprising  
2 material comprises  $(CH_3)_ySi(OH)_{4-y}$ , with y being greater than 0 and less  
3 than 4, and the energy is in the form of ultraviolet light; and wherein:

4 the exposing comprises passing the ultraviolet light through  
5 openings in a patterned mask and onto the layer of material to expose  
6 said some portions of the layer to the ultraviolet light while leaving said  
7 other portions unexposed; and

8 the common conditions comprising subjecting the entire layer to  
9 hydrofluoric acid, the hydrofluoric acid removing portions of the layer  
10 that were not exposed to ultraviolet light at a faster rate than portions  
11 of the layer that were exposed to ultraviolet light.

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*See Ant.*  
1 24. 20. The method of claim 10 wherein the silicon-comprising  
2 material comprises  $\text{Si}(\text{OH})_4$  and the energy is in the form of ultraviolet  
3 light; and wherein:

4 the exposing comprises passing the ultraviolet light through  
5 openings in a patterned mask and onto the layer of material to expose  
6 said some portions of the layer to the ultraviolet light while leaving said  
7 other portions unexposed; and

8 the common conditions comprising subjecting the entire layer to  
9 a solvent comprising hydrofluoric acid, the hydrofluoric acid removing  
10 portions of the layer that were not exposed to ultraviolet light at a  
11 faster rate than portions of the layer that were exposed to ultraviolet  
12 light.

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14 23. 21. The method of claim 10 wherein the silicon-comprising  
15 material comprises  $\text{Si}(\text{OH})_4$  and the energy is in the form of an electron  
16 beam; and wherein:

17 the exposing comprises exposing said some portions of the layer  
18 to the electron beam while leaving said other portions unexposed; and

19 the common conditions comprising subjecting the entire layer to  
20 hydrofluoric acid, the hydrofluoric acid removing portions of the layer  
21 that were not exposed to the electron beam at a faster rate than  
22 portions of the layer that were exposed to the electron beam.

1 *Sub B2* 22. A semiconductor processing method, comprising:

2 forming a layer of  $(CH_3)_ySi(OH)_{4-y}$ , with  $y$  being greater than 0  
3 and less than 4, over a substrate;

4 exposing some portions of the layer to ultraviolet light while  
5 leaving other portions unexposed, the exposing converting the exposed  
6 portions to  $(CH_3)_xSiO_{2-x}$ , with  $x$  being greater than 0 and less than 2;  
7 and  
8 after the exposing, subjecting the exposed and unexposed portions  
9 of the layer to hydrofluoric acid to selectively remove the  
10  $(CH_3)_ySi(OH)_{4-y}$  of the unexposed portions relative to the  $(CH_3)_xSiO_{2-x}$  of  
11 the exposed portions.

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13 25. 23. The method of claim 22 wherein the ultraviolet light is  
14 passed onto the layer of  $(CH_3)_ySi(OH)_{4-y}$  through openings in a  
15 patterned mask.

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17 26. 24. The method of claim 22 wherein the substrate is a  
18 semiconductive wafer, and further comprising:  
19 after the selective removal of the  $(CH_3)_ySi(OH)_{4-y}$  of the unexposed  
20 portions, and while the  $(CH_3)_xSiO_{2-x}$  of the exposed portions remains  
21 over the substrate, cutting the wafer into separated die.

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1 25. A semiconductor processing method, comprising:  
2 forming a layer of  $\text{Si}(\text{OH})_4$  over a substrate;  
3 exposing some portions of the layer to energy while leaving other  
4 portions unexposed, the exposing converting the exposed portions to  
5  $\text{SiO}_2$ ; and  
6 after the exposing, subjecting the exposed and unexposed portions  
7 of the layer to hydrofluoric acid to selectively remove the  $\text{Si}(\text{OH})_4$  of  
8 the unexposed portions relative to the  $\text{SiO}_2$  of the exposed portions.

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10 28. 26. The method of claim 25 wherein the energy is in the form  
11 of ultraviolet light.

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13 29. 27. The method of claim 25 wherein the energy is in the form  
14 of ultraviolet light and is passed onto the layer of  $\text{Si}(\text{OH})_4$  through  
15 openings in a patterned mask.

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17 30. 28. The method of claim 25 wherein the energy is in the form  
18 of an electron beam.

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31 26 The method of claim 25 wherein the substrate is a  
semiconductive wafer, and further comprising:

3 after the selective removal of the  $\text{Si}(\text{OH})_4$  of the unexposed  
4 portions, and while the  $\text{SiO}_2$  of the exposed portions remains over the  
5 substrate, cutting the wafer into separated die.

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